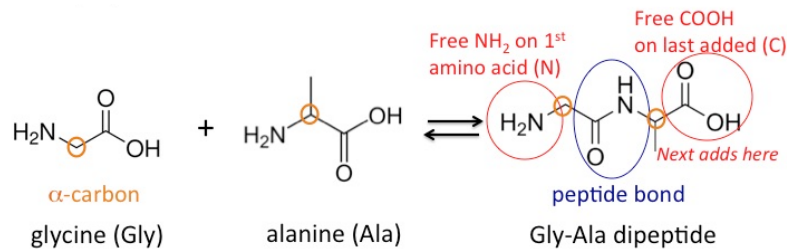


Protein polarity and structure – Reference Summary

Anatomy of a nucleic acid polymer



The diagram above shows the synthesis of a dipeptide from two amino acid monomers.

The alpha-carbons have been circled in orange.

The peptide bond that forms upon synthesis is circled in blue.

The polypeptide is polymerized from the N end to the C end. The amino acid at the N end has a free NH₂ group and the amino acid at the C end has a free COOH group.

Nomenclature

Proteins are written with three or one letter amino acid code from N to C.

ALWAYS write N and C on each protein!

For example:



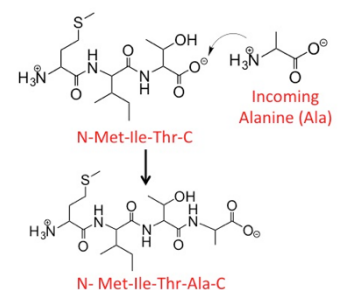
Polarity of Synthesis

A polypeptide chain is synthesized from N to C. Therefore, the –C end is the growing end (for addition of next amino acid).

Amino acid order = INFORMATION

Polarity = N and C ends show first to last amino acid added

The similarity in order and polarity between nucleic acids and proteins stems from the **Central Dogma of Molecular Biology**

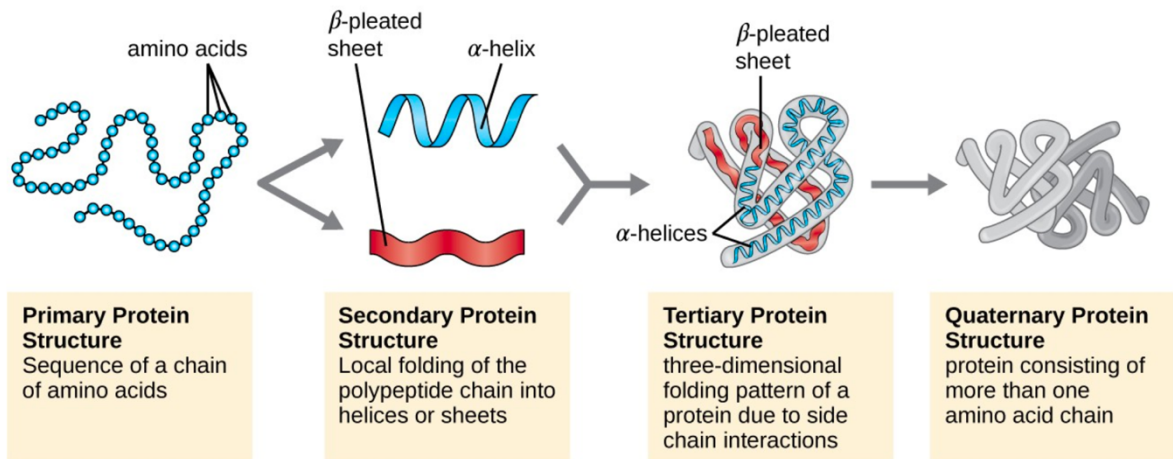


1) DNA makes RNA, and RNA makes protein

2) Once "information" has passed into protein it cannot get out again. In more detail, the transfer of information (*i.e.*, bases or amino acid sequence) from nucleic acid to nucleic acid, or from nucleic acid to protein may be possible, but transfer from protein to protein, or from protein to nucleic acid is impossible.

Protein structure

The structure of a protein is a critical determinant of its function and is described by a graduated classification: **primary, secondary, tertiary, and quaternary**



Modifications in any of the structure levels of a protein may result in a major human disease.